

Trend Study 6-4-01

Study site name: Echo Reservoir.

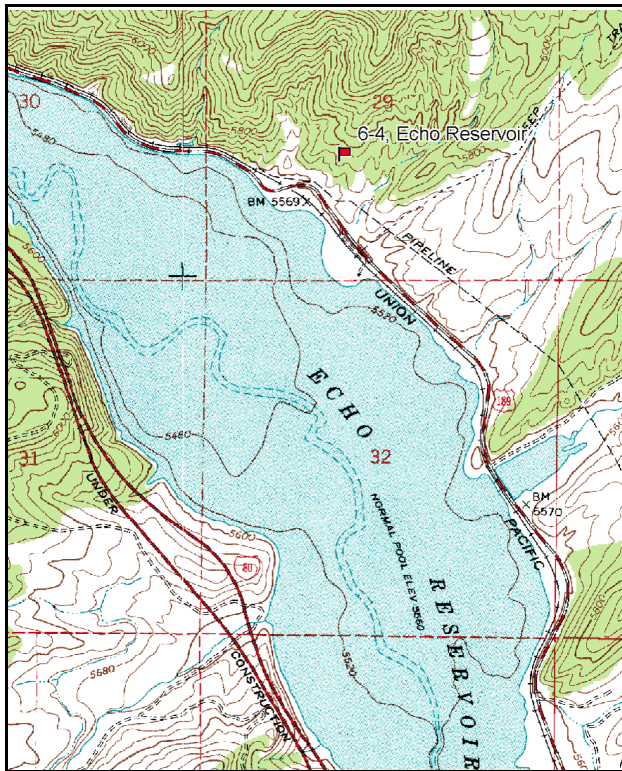
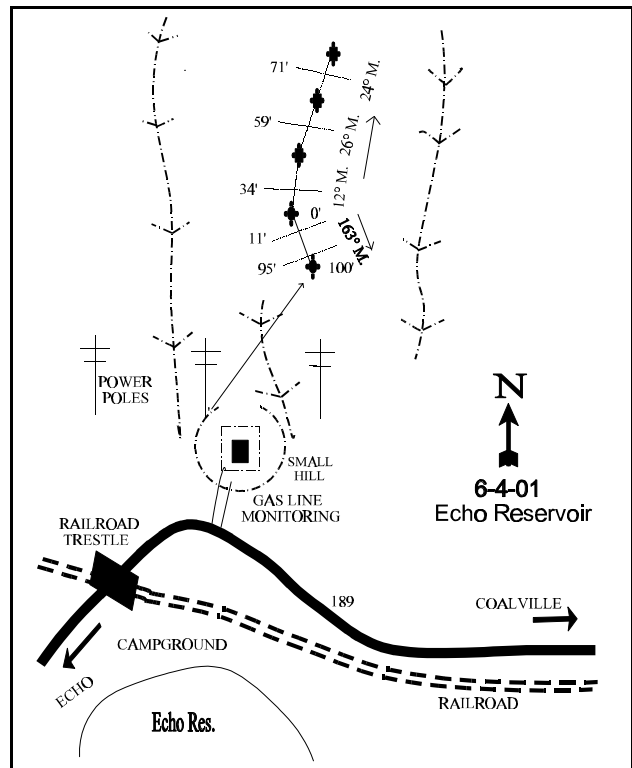
Vegetation type: Juniper.

Compass bearing: frequency baseline 163 degrees magnetic.

Frequency belt placement: Line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the east end of Echo Dam, proceed toward Coalville on Highway 189 to a point where the road passes over railroad tracks. Continue for approximately 150 yards to a spur road on the left that leads to a gas monitoring station on a small hill. From the power pole, approximately 25 yards north of the station, walk up the narrow ridge north of the power pole approximately 70 paces at 45 degrees true to the 100-foot stake of the baseline. The 0-foot stake is marked by browse tag #7970. The rest of the baseline runs off the 0-foot baseline stake. Line 2 runs in a direction of 34 degrees magnetic. Line 3 runs in a direction of 26 degrees magnetic. Line 4 runs in a direction of 24 degrees magnetic.

Map Name: CoalvilleTownship 3N, Range 5E, Section 29

Diagrammatic Sketch

UTM 4534516 N 465647 E

DISCUSSION

Trend Study No. 6-4

The Echo Reservoir study samples a Utah juniper community located immediately east of Echo Reservoir near Coalville. This area has critical importance to wintering deer, and to a lesser extent elk. Topographically, the study area is on a rugged southwest-facing slope that becomes very steep on the north and east, but is more gentle near the reservoir. Elevation of the study is about 5,600 feet. Much of the surrounding area, including the high ridge to the north and the bench lands lying immediately adjacent to Grass Creek, were consumed by fire prior to 1977. The old line intercept transect, as well as the range trend study, both lie entirely within unburned juniper.

Big game use of this study area can generally be classified as moderate to heavy. Deer use was known to be heavy prior to 1977 and has, if anything, increased in the intervening years. Although deer were fed at two nearby locations during the winter of 1983-84, signs of long-term winter use was intense. The result of heavy use has been the elimination of nearly all the browse forage, which was already in low abundance. The only species currently capable of providing more than token amounts of browse forage is Utah juniper. Even this species was intensely "highlined" in the past, and provides only limited forage. Further evidence of heavy deer use is provided by the more than 50 winter-killed carcasses from the critical winter of 1983-84 being observed along the old line intercept transect. A pellet group transect read on the site in 2001 estimated 63 deer days use/acre (155 ddu/ha), 8 elk days use/acre (20 edu/ha), and 4 cow days use/acre (9 cdu/ha). In 2001, 3 deer carcasses were also observed on the site.

Soil is a coarse textured, cobblestone loam derived from conglomerate parent material. Effective rooting depth was estimated at just over 12 inches. The soil is clay loam in texture with a moderately alkaline soil reaction (7.9 pH). One characteristic that is of concern is the high average soil temperature on the site determined to be nearly 76°F in 1996. This high of a soil temperature helps explain the presence of cheatgrass, a winter annual, on the site. High soil temperatures are often indicative that a site is prone to invasion by annual species. On the more gentle slopes, soil depth is moderate. On the steeper slopes, soil depth is more shallow and the erosion rate is more rapid. Bare soil has ranged from 23% in 1996 to 32% in 1990. Most of the bare soil lies in the interspaces between juniper trees. On more gentle areas, there is good litter cover under tree crowns and fair grass cover within the tree interspaces. Apart from some unpalatable increasers, shrubs provide very little cover or forage. An erosion condition class assessment done in 2001 determined soil erosion as moderate.

Browse composition consists of a variety of shrubs, of which only mountain big sagebrush and Saskatoon serviceberry are palatable. The remaining species are less preferred and generally classed as increasers or invaders. Most abundant are stickleaf low rabbitbrush and broom snakeweed. Big sagebrush and serviceberry occurred at very low densities in the past, with an understandably high incidence of decadence. In 2001, no live plants of either species were sampled on the site. Utah juniper is highlined, but not like it was in the winters of 1982-84. It has shown significant recovery, yet is still a limited source of low quality browse. Point-centered quarter data taken in 2001 estimated 80 juniper trees/acre.

Considering the dominant species on the site is juniper, grasses are moderately abundant. Cheatgrass brome was the dominant grass in 1996, providing 64% of the grass cover and 38% of the total vegetative cover on the site. Cheatgrass significantly declined in nested frequency and cover in 2001 due to the drought conditions of 2000 and 2001 in Northern Utah. Perennial grasses nearly doubled in cover in 2001. Indian ricegrass, Sandberg bluegrass, and needle-and-thread all significantly increased in nested frequency in 2001, while bluebunch wheatgrass significantly decreased in nested frequency. Overall, perennial grass sum of nested frequency values increased between 1996 and 2001. Perennial grasses were large and vigorous in

2001. They were also noted as producing plenty of seed. Forbs have been relatively insignificant during all years it has been sampled, contributing only 2% average cover in 2001.

1984 APPARENT TREND ASSESSMENT

Although this area is characterized by heavy sheet and gully erosion, there is some evidence of improvement since 1977. The increase in grass density and vigor, especially that of perennial grasses, suggests a slight improvement in soil trend. In contrast, there has been a new low in shrub cover. Overall trend is only marginally better. Vegetative trend appears to be going downward because of the obvious decline or disappearance of valuable browse species, severe highlining of Utah juniper, and an apparent increase among less palatable increaser shrubs.

1990 TREND ASSESSMENT

The downward browse trend assessed in 1984 for this heavily used winter range still applies. The estimated 101 juniper trees/acre are mostly mature, severely highlined trees. Low rabbitbrush provides most of the browse forage. Opuntia and broom snakeweed are the only browse species that increased in density. The perennial grass component has improved since 1984. The site has a good stand of bluebunch wheatgrass, which increased significantly in frequency, plus Indian ricegrass and needle-and-thread. However, the percentage of litter cover declined, which would be expected with the extended drought. Bare areas increased which could cause more sheet and gully erosion on the steeper slopes.

TREND ASSESSMENT

soil - slightly downward (2)

browse - down (1)

herbaceous understory - slightly up with increases in perennial grasses (4)

1996 TREND ASSESSMENT

Percent bare ground has decreased from 32% to 23%. The nested frequency ratio of bare ground to protective cover (vegetation, litter, and cryptogams) is good at over 1:3. Soil trend is considered slightly up. The browse trend is continuing downward with most all of the preferred key browse species dying off. The trend for the herbaceous understory is slightly down, especially for perennial grasses. Sum of nested frequency for perennial grasses decreased by 16% between 1990 and 1996. Cheatgrass currently contributes 64% of the grass cover, which makes the site a hazard for destructive wildfires.

TREND ASSESSMENT

soil - improved, still only fair (4)

browse - continuing downward, loss of almost all preferred browse species (1)

herbaceous understory - slightly down due to decreased frequency of perennial grasses (2)

2001 TREND ASSESSMENT

Trend for soil is stable. Bare soil slightly increased, but the nested frequency ratio of bare soil to protective cover (vegetation, litter, and cryptogams) only slightly declined, and is still good at over 1:3. Trend for browse remains down. Palatable browse is in very low abundance. Juniper is the dominant browse. The less palatable species, low rabbitbrush, prickly pear, and snakeweed, are the most abundant shrubs. Trend for the herbaceous understory is slightly up. Perennial grasses increased in sum of nested frequency, and cheatgrass brome has greatly reduced cover and frequency due to drought.

TREND ASSESSMENT

soil - stable (3)

browse - down (1)

herbaceous understory - slightly up (4)

HERBACEOUS TRENDS --

Herd unit 06 , Study no: 4

T y p e	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'84	'90	'96	'01	'84	'90	'96	'01	'96	'01
G	Agropyron dasystachyum	_{ab} 13	_b 21	_{ab} 7	_a 6	6	9	3	2	.18	.15
G	Agropyron spicatum	_a 81	_b 130	_c 177	_{ab} 109	31	51	63	44	5.22	4.59
G	Bromus brizaeformis (a)	-	-	7	-	-	-	4	-	.02	-
G	Bromus japonicus (a)	-	-	-	2	-	-	-	1	-	.00
G	Bromus tectorum (a)	-	-	_b 323	_a 152	-	-	93	62	15.37	1.27
G	Oryzopsis hymenoides	_b 71	_b 79	_a 26	_b 70	31	38	13	36	.43	3.11
G	Poa fendleriana	_a -	_a -	_b 18	_a -	-	-	6	-	.13	-
G	Poa pratensis	-	-	2	5	-	-	1	2	.00	.30
G	Poa secunda	_a 10	_c 143	_b 63	_c 150	5	52	24	59	.93	2.65
G	Sitanion hystrix	-	-	1	3	-	-	1	1	.03	.00
G	Sporobolus cryptandrus	2	1	-	-	1	1	-	-	-	-
G	Stipa comata	_a 32	_a 47	_a 61	_b 92	16	25	26	38	1.87	5.07
Total for Annual Grasses		0	0	330	154	0	0	97	63	15.39	1.28
Total for Perennial Grasses		209	421	355	435	90	176	137	182	8.81	15.89
Total for Grasses		209	421	685	589	90	176	234	245	24.20	17.17
F	Agoseris glauca	-	1	-	-	-	1	-	-	-	-
F	Alyssum alyssoides (a)	-	-	_b 291	_a 264	-	-	90	89	2.98	1.28
F	Allium spp.	-	-	-	4	-	-	-	2	-	.01
F	Antennaria rosea	_b 24	_b 20	_a -	_a 3	10	8	-	1	-	.00
F	Astragalus spp.	-	-	-	3	-	-	-	1	-	.00
F	Astragalus utahensis	_b 79	_a 17	_b 68	_a 38	34	10	31	18	1.45	.29
F	Camelina microcarpa (a)	-	-	-	1	-	-	-	1	-	.00
F	Calochortus nuttallii	-	-	-	10	-	-	-	3	-	.01
F	Cirsium undulatum	8	2	3	-	4	2	2	-	.03	-
F	Collomia linearis (a)	-	-	-	3	-	-	-	1	-	.00
F	Collinsia parviflora (a)	-	-	-	8	-	-	-	4	-	.04
F	Cordylanthus ramosus (a)	-	-	-	1	-	-	-	1	-	.00
F	Crepis acuminata	-	-	1	-	-	-	1	-	.00	-
F	Cryptantha spp.	-	-	10	-	-	-	3	-	.06	-
F	Cymopterus spp.	-	-	2	6	-	-	2	2	.01	.01
F	Descurainia pinnata (a)	-	-	-	1	-	-	-	1	-	.00

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'84	'90	'96	'01	'84	'90	'96	'01	'96	'01
F	Draba spp. (a)	-	-	-	2	-	-	-	1	-	.00
F	Epilobium brachycarpum (a)	-	-	-	4	-	-	-	2	-	.03
F	Eriogonum brevicaulis	6	2	5	-	2	2	4	-	.09	-
F	Erigeron pumilus	a-	ab ⁵	a-	b ¹²	-	2	-	6	-	.08
F	Galium aparine (a)	-	-	-	2	-	-	-	1	-	.00
F	Hackelia patens	-	-	4	-	-	-	3	-	.01	-
F	Holosteum umbellatum (a)	-	-	1	6	-	-	1	4	.00	.02
F	Lesquerella spp.	-	-	-	3	-	-	-	1	-	.00
F	Lomatium spp.	-	-	-	3	-	-	-	2	-	.01
F	Machaeranthera grindelioides	-	-	-	5	-	-	-	2	-	.03
F	Penstemon humilis	1	-	-	-	1	-	-	-	-	-
F	Phlox austromontana	22	21	12	8	11	9	5	5	.12	.19
F	Phlox longifolia	-	1	-	-	-	1	-	-	-	-
F	Ranunculus testiculatus (a)	-	-	-	5	-	-	-	3	-	.01
F	Sphaeralcea coccinea	30	29	24	19	12	13	11	9	.49	.31
F	Townsendia spp.	-	-	-	5	-	-	-	2	-	.01
F	Tragopogon dubius	b ¹⁵	a ¹	a ¹	a-	8	1	1	-	.00	-
F	Vicia americana	-	-	-	3	-	-	-	2	-	.01
Total for Annual Forbs		0	0	292	297	0	0	91	108	2.98	1.43
Total for Perennial Forbs		185	99	130	122	82	49	63	56	2.30	1.00
Total for Forbs		185	99	422	419	82	49	154	164	5.29	2.43

Values with different subscript letters are significantly different at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --

Herd unit 06 , Study no: 4

Type	Species	Strip Frequency		Average Cover %	
		'96	'01	'96	'01
B	Chrysothamnus nauseosus albicaulis	2	1	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	36	27	1.18	.72
B	Gutierrezia sarothrae	36	33	1.12	.90
B	Juniperus osteosperma	3	2	7.92	5.48
B	Opuntia spp.	36	41	1.15	.90
B	Tetradymia canescens	1	3	-	.03
Total for Browse		114	107	11.39	8.03

CANOPY COVER --

Herd unit 06 , Study no: 4

Species	Percent Cover		Trees per Acre		Average diameter (in)	
	'96	'01	'96	'01	'96	'01
Juniperus osteosperma	15	18	101	80	10.4	12.6

Point-Quarter Tree Data

BASIC COVER --

Herd unit 06 , Study no: 4

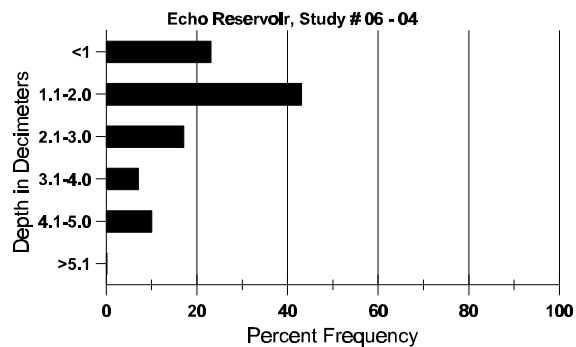
Cover Type	Nested Frequency		Average Cover %			
	'96	'01	'84	'90	'96	'01
Vegetation	381	334	6.50	7.25	37.54	31.35
Rock	132	88	1.25	1.50	2.04	1.21
Pavement	248	262	2.25	4.50	6.47	6.97
Litter	387	348	61.00	46.50	37.07	31.57
Cryptogams	161	236	.75	7.75	6.51	16.85
Bare Ground	282	292	28.25	32.50	23.30	27.64

SOIL ANALYSIS DATA --

Herd Unit 06, Study no: 04, Echo Reservoir

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
12.3	75.6 (12.1)	7.9	44.7	24.0	31.3	2.1	4.3	38.4	.5

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 06 , Study no: 4

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'96	'01	'01	'01
Rabbit	2	19	44	N/A
Elk	5	2	104	8 (20)
Deer	31	36	818	63 (155)
Cattle	1	3	-	-

BROWSE CHARACTERISTICS --

Herd unit 06 , Study no: 4

A Y G R E	Form Class (No. of Plants)	Vigor Class								Plants Per Acre	Average (inches) Ht. Cr.	Total							
		1	2	3	4	5	6	7	8				9	1	2	3	4		
Amelanchier alnifolia																			
Y	84	-	1	-	-	-	-	-	-	-	1	-	-	-	66		1		
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
M	84	-	-	5	-	-	1	-	-	-	6	-	-	-	400	42 14	6		
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0		
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0		
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0		
D	84	-	-	6	-	-	-	-	-	-	5	1	-	-	400		6		
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
% Plants Showing		<u>Moderate Use</u>					<u>Heavy Use</u>					<u>Poor Vigor</u>					<u>%Change</u>		
'84		08%					92%					00%							
'90		00%					00%					00%							
'96		00%					00%					00%							
'01		00%					00%					00%							
Total Plants/Acre (excluding Dead & Seedlings)												'84	866	Dec:	46%				
												'90	0		0%				
												'96	0		0%				
												'01	0		0%				

A Y G R E	Form Class (No. of Plants)	Vigor Class									Plants Per Acre	Average (inches) Ht. Cr.	Total					
		1	2	3	4	5	6	7	8	9				1	2	3	4	
Artemisia tridentata vaseyana																		
D	84	-	1	1	-	-	-	-	-	-	1	-	1	-	66		2	
	90	-	1	-	-	-	-	-	-	-	-	-	-	1	33		1	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	260		13	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		50%			50%			50%			-50%							
'90		100%			00%			100%										
'96		00%			00%			00%										
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	66	Dec:	100%			
												'90	33		100%			
												'96	0		0%			
												'01	0		0%			
Chrysothamnus nauseosus albicaulis																		
M	84	-	-	1	-	-	-	-	-	-	-	1	-	-	33	19	18	1
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	27	40	0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0	21	20	0
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	1	-	-	-	-	-	-	-	-	1	-	33		1	
	96	1	-	1	-	-	-	-	-	-	1	-	-	1	40		2	
	01	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			100%			00%			+ 0%							
'90		00%			100%			100%			+18%							
'96		00%			50%			50%			-50%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	33	Dec:	0%			
												'90	33		100%			
												'96	40		100%			
												'01	20		100%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus viscidiflorus viscidiflorus																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	1	-	-	-	-	-	-	-	-	-	1	-	-	20		1	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	84	1	-	-	-	-	-	-	-	-	-	1	-	-	66		1	
	90	1	-	-	-	-	-	-	-	-	-	1	-	-	66		1	
	96	28	-	-	-	-	-	-	-	-	-	28	-	-	560		28	
	01	5	-	-	-	-	-	-	-	-	-	5	-	-	100		5	
M	84	31	-	-	-	-	-	-	-	-	-	14	17	-	2066	12 18	31	
	90	22	3	1	-	-	-	-	-	-	-	9	-	17	1733	10 14	26	
	96	67	-	-	-	-	-	-	-	-	-	67	-	-	1340	8 14	67	
	01	41	1	-	-	-	-	-	-	-	-	42	-	-	840	6 10	42	
D	84	34	11	-	-	-	-	-	-	-	-	45	-	-	3000		45	
	90	5	-	3	-	-	-	-	-	-	-	1	-	5	533		8	
	96	1	1	-	-	-	-	-	-	-	-	2	-	-	40		2	
	01	13	-	-	-	-	-	-	-	-	-	11	-	-	260		13	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		14%			00%			00%			-55%							
'90		09%			11%			69%			-17%							
'96		01%			00%			00%			-38%							
'01		02%			00%			03%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	5132	Dec:	58%			
												'90	2332		23%			
												'96	1940		2%			
												'01	1200		22%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	90	17	-	-	-	-	-	-	-	-	17	-	-	566			17	
	96	35	-	-	-	-	-	-	-	-	35	-	-	700			35	
	01	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
Y	84	2	-	-	-	-	-	-	-	-	2	-	-	66			2	
	90	36	-	-	-	-	-	-	-	-	31	-	4	1200			36	
	96	29	-	-	-	-	-	-	-	-	29	-	-	580			29	
	01	2	-	-	-	-	-	-	-	-	2	-	-	40			2	
M	84	40	-	-	-	-	-	-	-	-	40	-	-	1333	13	14	40	
	90	31	-	-	-	-	-	-	-	-	30	-	1	1033	8	7	31	
	96	64	-	-	-	-	-	-	-	-	64	-	-	1280	8	10	64	
	01	107	-	-	-	-	-	-	-	-	107	-	-	2140	6	8	107	
D	84	1	-	-	-	-	-	-	-	-	1	-	-	33			1	
	90	4	-	-	-	-	-	-	-	-	3	-	-	133			4	
	96	2	-	-	-	-	-	-	-	-	-	-	-	40			2	
	01	10	-	-	-	-	-	-	-	-	5	-	1	200			10	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			00%			00%			+39%							
'90		00%			00%			10%			-20%							
'96		00%			00%			02%			+20%							
'01		00%			00%			04%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	1432	Dec:	2%			
												'90	2366		6%			
												'96	1900		2%			
												'01	2380		8%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total		
		1	2	3	4	5	6	7	8	9	1	2	3	4						
Juniperus osteosperma																				
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0			
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1		
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0				0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0					0
Y	84	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1			
	90	-	1	-	-	-	-	-	-	-	1	-	-	-	33			1		
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0				0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0					0
M	84	-	-	-	-	-	1	-	-	-	-	-	1	-	33	69	47			
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0		
	96	2	-	-	-	-	-	-	1	-	3	-	-	-	60	-	-		3	
	01	-	1	-	-	-	-	-	1	-	2	-	-	-	40	-	-			2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>									
'84		00%			50%			50%			-50%									
'90		100%			00%			00%			+45%									
'96		00%			00%			00%			-33%									
'01		50%			00%			00%												
Total Plants/Acre (excluding Dead & Seedlings)												'84	66	Dec:	-					
												'90	33		-					
												'96	60		-					
												'01	40		-					

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Opuntia spp.																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	01	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
Y	84	11	-	-	-	-	-	-	-	-	11	-	-	-	366		11	
	90	9	-	-	1	-	-	-	-	-	9	-	1	-	333		10	
	96	13	-	-	-	-	-	-	-	-	13	-	-	-	260		13	
	01	6	-	-	-	-	-	-	-	-	6	-	-	-	120		6	
M	84	19	-	-	-	-	-	-	-	-	19	-	-	-	633	6 16	19	
	90	25	-	-	-	-	-	-	-	-	18	-	7	-	833	4 16	25	
	96	48	-	-	1	-	-	-	-	-	47	-	2	-	980	5 18	49	
	01	51	1	-	-	-	-	24	-	-	74	1	-	1	1520	5 10	76	
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1	
	96	3	-	-	-	-	-	-	-	-	1	-	-	2	60		3	
	01	2	-	-	-	-	-	-	-	-	1	-	-	1	40		2	
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	120		6	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	120		6	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			00%			00%			+17%							
'90		00%			00%			22%			+ 8%							
'96		00%			00%			06%			+23%							
'01		01%			00%			02%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	999	Dec:	0%			
												'90	1199		3%			
												'96	1300		5%			
												'01	1680		2%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
Y	84	5	-	-	-	-	-	-	-	-	5	-	-	-	333		5	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	84	8	4	-	-	-	-	-	-	-	12	-	-	-	800	27	25	12
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
D	84	-	2	-	-	-	-	-	-	-	2	-	-	-	133		2	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		32%			00%			00%										
'90		00%			00%			00%										
'96		00%			00%			00%										
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	1266	Dec:		11%		
												'90	0			0%		
												'96	0			0%		
												'01	0			0%		
Tetradymia canescens																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	2	-	-	-	-	-	-	-	-	2	-	-	-	40	8	16	2
	01	-	1	-	-	-	-	-	-	-	1	-	-	-	20	12	24	1
D	84	-	2	-	-	-	-	-	-	-	-	2	-	-	66			2
	90	-	2	-	-	-	-	-	-	-	-	1	1	-	66			2
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	4	-	-	-	-	-	-	-	-	1	-	-	-	80			4
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		100%			00%			00%			+ 0%							
'90		100%			00%			50%			-39%							
'96		00%			00%			00%			+60%							
'01		20%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	66	Dec:		100%		
												'90	66			100%		
												'96	40			0%		
												'01	100			80%		